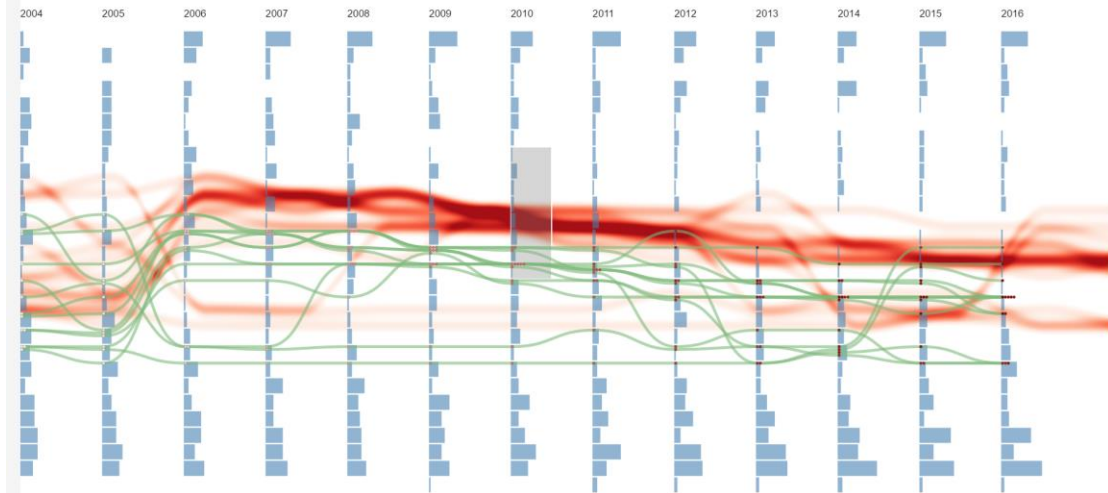


# Weekly Report 2016.01.03-2017.01.08

## Progress:

### 1. Temporal Ensemble Rankings



The heatmap based on webgl is almost done.

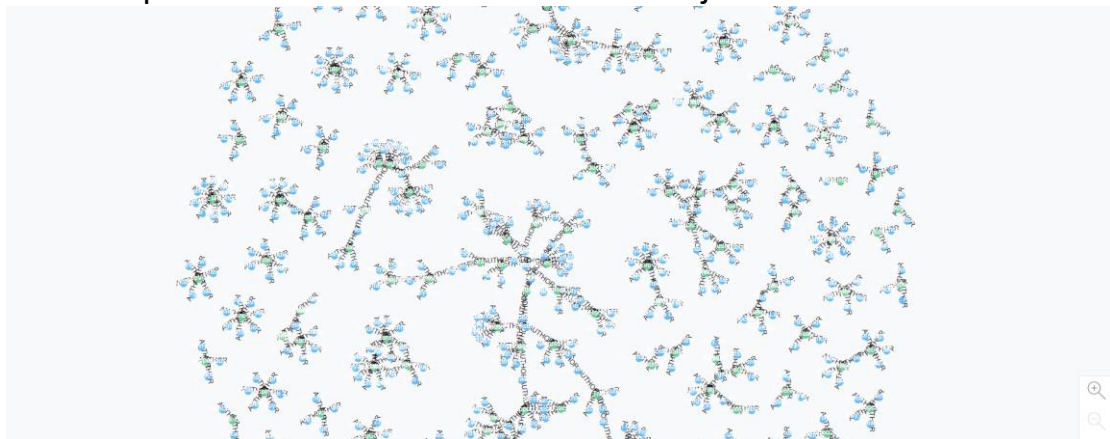
But there are some bugs in this implementation. The basic problem is that we store the lines as parameters in a texture. This is not a very good choice. I think we can draw the lines first in an image, and then send the image into shader.

Dongming is implementing the interactions in the cluster view.

### 2. TCP Tree

### 3. Anomaly Detection in Dynamic Graphs

I have import the data into the database neo4j.



This is the network formed by paper and authors at 2015.

This is my first time to use neo4j, so it takes me some time to learn how to use neo4j, as the language used in it is totally different from other databases.

I also find the proper hierarchical clustering method for our application, Girvan-Newman algorithm, to generate the tree structure.

And I also wrote the code of finding a best cut of the tree based on a metric called modularity.

```
def best_cut(g, node, cluFlag):
    global cluID
    if isinstance(node, list):
        clu1 = node[0]
        clu1Nodes = plain(clu1)
        cluID += 1
        for i in clu1Nodes:
            cluFlag[i] = cluID
        clu2 = node[1]
        clu2Nodes = plain(clu2)
        cluID += 1
        for i in clu2Nodes:
            cluFlag[i] = cluID

        #change this equation
        modularity = g.modularity(cluFlag)

        leftModul, leftFlag = best_cut(g, clu1, cluFlag[:])

        if(leftModul > modularity):
            cluFlag = leftFlag
            modularity = leftModul

        rightModul, rightFlag = best_cut(g, clu2, cluFlag[:])

        if(rightModul > modularity):
            cluFlag = rightFlag
            modularity = rightModul
    else:
        cluID += 1
        cluFlag[node] = cluID
        modularity = g.modularity(cluFlag)

    return modularity, cluFlag
```

If we change the calculation of the modularity, we can change the result of the tree cutting. I think we can add a another term into `g.modularity(cluFlag)`.

I also asked Jiacheng to start the implementation of the basic matrix interaction, as we already have the basic tree structure.

**Plan:**

## **1. Temporal Ensemble Ranking Data**

Implement the heatmap and the interactions in the cluster view.

## **2. Anomaly Detection in Dynamic Graphs**

论文阅读:

### **1. Interactive Visualization of Multivariate Trajectory Data with Density Maps**

这篇文章介绍了一种基于轨迹的密度图实现方法。本周我主要参照这种方法实现了一个基于 `webgl` 的 heatmap。

### **2. Finding and evaluating community structure in networks**

这篇文章介绍了一种社团发现算法，这种算法能够生成一个 **dendrogram**，并使用一种名为 **modularity** 的方法来评估最佳的切分方式。

### **3. Sparse Sampling and Completion for Light Transport in VPL-based Rendering**

这篇文章介绍了一种改进的 **light cut** 方法。